

# AVIATION

*The Oldest American Aeronautical Magazine*

MAY 23, 1927

Issued Weekly

PRICE 15 CENTS



Capt. Charles A. Lindbergh's Ryan monoplane, in which he will attempt the Atlantic Flight

VOLUME  
XXII

## SPECIAL FEATURES

NUMBER  
21

NIGHT FLYING EQUIPMENT FOR THE AIRDROME  
SOME TECHNICAL ASPECTS OF THE AIRCRAFT DISPLAY  
CALIFORNIA STATE AERONAUTICAL CONFERENCE

AVIATION PUBLISHING CORP.  
HIGHLAND, N. Y.  
250 W. 57TH ST., NEW YORK

Entered as Second-Class Matter, Nov. 22, 1920, at the Post Office, at Highland, N. Y.  
under Act of March 8, 1879



Lieut. S. W. Callaway, G. B. Henderson and J. D. Berner, U. S. N. in front of the "Wasp" engine "Cessna" airplane.

### Altitude

On April 14, 1927, Lieut. G. B. Henderson, U.S.N. in a "Cessna" Seaplane reached 22,176 feet with a dead load of 1,102 pounds and a total useful load of over 1700 pounds.

### Speed 100 Kilometers

On April 23, 1927, Lieut. S. W. Callaway, U.S.N. with the same plane and load averaged 147.263 miles per hour for 100 kilometers around a closed course.

### Speed 500 Kilometers

On April 30, 1927, Lieut. J. T. Berner, U.S.N. under the same conditions averaged 136.023 miles per hour for 500 kilometers.



## Three New World's Records for the "WASP"

This standard Vought Seaplane with a standard "Wasp" Engine holds the unique distinction of having established world's records for both altitude and speed. Particularly remarkable is the fact that Lieut. Callaway's average speed was more than five miles per hour greater around a closed course than the winning time in the two-place observation land plane race at the National Air Races in Philadelphia last year.

This remarkable performance is the natural result of superior plane and engine design, and skillful piloting. Again the Navy gives substantial proof that its flying officers and service equipment are second to none.

THE  
**PRATT & WHITNEY AIRCRAFT CO.**  
HARTFORD CONNECTICUT

LANDING FACILITIES

MUNICIPAL FIELD AND CONNECTICUT RIVER

ON AIRWAYS MAPS

## The Keynotes of Tomorrow's Plane

STANDING out above all other considerations, two points must dominate the flying fleets of the future. The first is *safety in flight*; the second, *enduring dependability of materials*. The flying life of planes must be radical increased to reduce operating cost per mile flown. The safety factor must be raised in order to bring about maximum public confidence in and employment of freight and passenger carriers.

In the shops, laboratories and draughting rooms of the Glenn L. Martin Company has been launched the most extensive and detailed research and development program ever attempted in aeronautics since the dream of air-travel first took shape in human minds.

THE GLENN L. MARTIN COMPANY  
*Builders of Quality Aircraft since 1909*  
CLEVELAND, OHIO



THE GLENN L. MARTIN COMPANY

## FOR THE NATIONAL GUARD



## THE NEW CURTISS "FALCON"

A recent contract awarded by the Government will make available, this year, a quantity of Curtiss "Falcons" equipped with the Liberty motor, for use by the National Guard.

The "Falcon" has the highest performance of any two-seater military airplane in service today. Having thoroughly established its superiority by service tests extending over the past two years, it is now being purchased in large quantities as the standard service observation and attack plane of the Air Corps.

The equipment of the National Guard with the "Falcon" is in accordance with the far-sighted policy of the government in providing all branches of the service with the most modern of aircraft material.

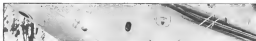
THE CURTISS AEROPLANE

Office:  
GARDEN CITY, N. Y.



A MOTOR COMPANY, INC.

Factories:  
GARDEN CITY & BUFFALO, N. Y.



## THE DOUBLE DUTY OF TIRES



THE opened throttle commands airplane tires to be fleet and nimble, to spin easily and swiftly as the ship hurries into flight.

And then, the journey over, these same tires must bear speeding weight and human life to safety as the plane strikes ground again. Thus, in every flight Goodyear Airplane Tires reveal their agility and their strength. These tires as-

ist take-off performance because they are perfectly balanced and hold their proper pressures. They withstand the punishment of fast or awkward landing because they are built of finest materials by men who know how important tires are to safety.

Goodyear Airplane Tires are offered by an organization that wants aviation to prosper. Goodyear makes everything in rubber for the airplane.

*Representative Department*  
THE GOODYEAR TIRE & RUBBER COMPANY, INC., AKRON, OHIO

**GOODYEAR**  
AIRPLANE TIRES



Do You Visit  
Germany  
this Summer ?

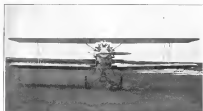
Save time  
See more

Travel with ease and comfort  
by using **Luft Hansa** air lines

**Deutsche Luft Hansa A.G.**

Berlin W. 8, Mauerstr. 61-65

Fernsprecher: Zentrum 5800 Telegramm Adresse Lufthansa, Berlin



### *The Consolidated Courier!*

A SPECIAL, convertible type, using the Wright Warwood engine, designed to provide the following: complete dual control for training and practice flying; passenger carrying, cabin of every sort, cross-country flying (with remarkable ability to get in and out of small fields); quarry practice both fixed and flexible; observation missions such as: These conditions may be had either as a biplane or as a single float airplane. Cockpits are very roomy and comfortable, with a large baggage compartment. Controls and installations in both cockpits are so arranged that either may be made quite clear for any desired purpose.

The CONSOLIDATED COURIER is a proven, developed airplane. It is fast, very maneuverable and it embodies the same features which have enabled its predecessor, the CONSOLIDATED TRUSTY and CONSOLIDATED HUSKY, to build such an unprecedented record for safety and dependability in long service by the Army Air Corps and the Naval Air Service in training operations. CONSOLIDATED TRUSTY, HUSKY and COURIER parts are practically all identical, making spare interchangeable.



### *The Consolidated Husky*

*Designed and constructed by*

**CONSOLIDATED AIRCRAFT CORPORATION**  
BUFFALO, NEW YORK

# The Publishers of AVIATION announce the American Aircraft Directory

A COMPLETE REFERENCE GUIDE  
to the  
AERONAUTICAL INDUSTRY OF THE UNITED STATES

## AMERICAN AIRCRAFT DIRECTORY

Alphabet  
Pilot Directory  
Aircraft Companies  
Company Officers  
Air Routes  
Maps  
Seaplane Stations  
Aircraft Officials  
Emergency Fields  
American Army  
American Airplane  
American Seaplane  
American Airplane  
American Seaplane  
Aircraft Associations  
Flying Schools  
Government Fields  
Hanger Directory  
Flying Clubs  
Bids and Regulations  
International Air Laws  
State Air Laws  
Municipal Air Laws  
License Fees  
Certified Pilots  
Aero Organizations  
Air Routes

THE DIRECTORY lists more than 2,000 pilots, 500 aircraft, accessory and operating companies, describes 500 active landing fields, and carries more than 100 illustrations.

Aircraft, Accessory and Parts Companies are listed, with officers, products or services, in the respective state sections as well as in the Trade Index.

INFORMATION INDISPENSIBLE TO AVIATION EXECUTIVES, SALES AND PURCHASING DEPARTMENTS, AERO ORGANIZATIONS, CHAMBERS OF COMMERCE, MUNICIPAL AVIATION COMMITTEES, STATE AND NATIONAL LEGISLATORS, OPERATING COMPANIES AND AIRCRAFT PILOTS.

To avoid disappointment reserve your copies of the DIRECTORY now, as advance orders indicate that the first edition quickly will be sold out. Cloth Bound \$5.00. Paper Bound \$3.00.

THE ADVERTISING PAGES CARRY THE SALES MESSAGES OF THE LEADING AIRCRAFT, PARTS AND MATERIAL MANUFACTURERS.

IF YOUR COMPANY HAS NOT YET RESERVED ADVERTISING SPACE, DO SO NOW IF YOU WISH TO BE REPRESENTED. YOU WILL REGRET THE OMISSION OF YOUR ADVERTISEMENT FROM THE DIRECTORY.

AVIATION PUBLISHING CORP.

250 WEST 57TH STREET, NEW YORK CITY



## There's unlimited performance behind the beauty of the WACO TEN

If ever an airplane had what the present day commercial and individual owner pilot calls performance this beautiful WACO TEN certainly has it—even to a greater extent than the previous Model Nine.

Designed to perform safely with a power range of from 90 to 250 horsepower. Giving any range of speed desired.

Have one of our representatives take you for a ride—if you are a pilot try it and learn of the wonderful performance everybody is talking about.

A letter or wire today will bring complete information price and name of our nearest WACO Representative.



The ADVANCE AIRCRAFT CO.  
TROY, OHIO U.S.A.

A Third  
WORLD'S RECORD  
made by  
The VOUGHT "CORSAIR"

Lipari, James D. Service  
U.S.N.

**F**OR the third time within three weeks a new World's Record has been established in the Vought "Comet."

On April 30th, Lt. James D. Barnes, U. S. N. flying over the Schneider Cup Course at Hampton Roads, Va., made a new speed record for Seaplanes carrying 500 Kilograms (1102 pounds) dead load.

The new record made was 136.023 miles per hour over the ten lap triangular course, exceeding the former

record by 18 miles per hour.

The actual useful load carried, including pilot, fuel, and equipment and 1102 pounds of ballast was 1880 pounds.

This record was made in the same standard "Coser" in which Lieut.

Gen. R. Henderson, U.S.N., on April 14th, made a new World's Altitude Record for Bombers, and in which Lieut. S. W. Callaway, U.S.N., on April 23rd, made a new Speed Record for 100 Kilometers.

The Stock Airplane which is bringing World's Records back to America

CHANCE VOUGHT CORPORATION  
LONG ISLAND CITY, NEW YORK



# AVIATION

Aviation Publishing Corp.

Business and Editorial Offices:—250 W. 57th St., New York

Cable Address:—AQUINO

**Publishing Office:—HIGHLAND, N. Y.**

Linda D. Casper

**Easa D. Ganiyu**, President

W. L. LaPine, Editor

George Newbold  
Business ManagerL. D. Williams  
Treasurer

Vol. XXII

MAY 23, 1927

No. 21

*With the Editor*

New test money of one contract air mail operations have been operating for just one year, the time in drawing near when the aeronautical field may expect to have significant opinions based upon real experience from those who have been responsible for the mail services which have been carried on and which form the nucleus of the air transportation system of the United States. The recent California State Aeronautical Conference held in San Francisco formed the background for the expression of such opinions when Harris H. Henson, president of the Western Air Engineers, addressed the meeting on the subject of Air Transportation.

As the head of one of the most successful of the air mail contract organizations, Mr. Henshaw's opinions are of considerable import. Among other outstanding facts, he brought out the basis of a new unit for measuring air transportation which is certain to place a different aspect upon the economics of this modern method of travel. Some of the outstanding features of Mr. Henshaw's comments are brought out in this issue of *Aviation*.

## Index to Contents

## NEWS ARTICLES AND ITEMS

On the Atlantic Flight Preparations .....	1002
A.S.T.A. Activities .....	1004
Mechanics Association Honors Pan-American Flyer .....	1005
California Holds Second State Aeronautical Conference .....	1006
Florida Harbinger Addresses Aeronautical Con- ference .....	1007

## FEATURES AND DEPARTMENTS

<b>Editorials</b>	307
Air Mail Contract Payments	307
Night Flying Equipment for the Airframe	307
Some Technical Aspects of the Display	308
The Aircraft Display at Rolling Field	308
Side Slips	309
Airports and Airways	309
United States Air Forces	309
Publisher's News Letter	310

## ADVERTISING INDEX

WHITE TO FLY	100-100
AIRCRAFT SERVICE DIRECTOR	100-100
CLASSIFIED ADVERTISING	100

**Subscriptions price:** Four dollars per year. Outside, five dollars. Foreign, six dollars. Single copies, 50 cents each. With money, 14 cents. Subscriptions must be prepaid.

issued every Monday. From the  
 1950s onwards, the *Journal* was  
 published under the name *Journal of the  
 Royal Society of Medicine*. It is  
 published by the Royal Society of Medicine,  
 11, St Andrews Place, Regents Park,  
 London, N.W.1.

Copyright 1991 by Aronson Publishing Corp.

## Profits are larger with Wright Whirlwind Engines

because of greater  
loads per horse  
power—lower cost  
per mile—six years  
of proved safety.

*That's why  
More Pilots fly them!*

The new E-5 engine is being used in Florida Airways' new four-seater and six-passenger touring planes. On the right is the Champion-Hammond six-seater. On the left is the Champion-Hammond six-seater. On the right is the Champion-Hammond six-seater. On the left is the Champion-Hammond six-seater.

See Wright's recommendations for pilot and plane personnel including in manuals and literature are provided with the standard engine. Send for details. P-1-1



# WRIGHT

WRIGHT AERONAUTICAL CORPORATION

PHILADELPHIA, PA. U.S.A.





**AVIATION**

The Oldest American Aeronautical Magazine

---

Vol. XXII MAY 23, 1927 No. 21

### When Engines Influence Aircraft Design

THE PAST few years have shown a trend in the production of aerial service planes in this country which illustrates in a most interesting manner the effect that the power plant has on aircraft design. All of our aerial service planes were designed around war surplus engines, the Curtiss OX series being the most popular. When the Wright Whirlwind engine became available for commercial use the manufacturers of commercial planes merely adopted their standard types to take the strain of the higher powered engine. It was some time before special planes, notably the patrol types, were developed around the Whirlwind engine and even now the patrol types have been adapted for the alternative fitting of low or high powered engines.

In aerial service flying past experience has shown that low initial cost is a matter of primary importance and the bulk of an engine of the modern and efficiency of the Wright Whirlwind but of lower horsepower is a matter of great concern in economical development. The commercial production of airplanes especially developed for the Whirlwind engine has taken a long time, and there is no reason for believing that the full advantage of the existence of a modern engine of around 100 hp will be realized for some time after such an engine is brought out. Smaller wing area, lighter structure and many other features will have to be incorporated in a design before the superiority of the lighter modern engine over the war surplus engine in the same power class will make itself really evident to the aircraft operator.

Those who now underestimate the manufacture of such a commercial engine are faced with a very difficult problem. The low price of war-surplus power plants has served to blind the producer to the advantage of the more expensive but highly efficient modern engine and the manufacture of such an engine meant paying the real value of his product until a plane has been especially designed for its use. The Wright Company tackled this problem in the case of the Whirlwind by building the Wright Billiana to demonstrate what could be done with such an engine in a plane which was specially designed to take it. There is another solution which might be adopted by manufacturers of aircraft in the low powered class, namely, that they should pull together and agree to have a certain number of units from whatever engine manufacturer first produces an engine which comes up to given specifications. This would start the ball rolling and would be a far sighted and intelligent way for the manufacturers of commercial planes to meet a very serious situation.

### It Must Be Conquered

THERE ARE certain subjects which the editor sitting at his desk feels that he has hardly any business in writing about. One of these is the question of flying in fog and clouds. There is nothing more simple or which is therefore but every one who has plunged into the depths of a cloud knows that there are many and various dangers.

From the respective viewpoints of civil and military aviation the solution of fog flying problems appears from different angles. To civil aviation fog is always a nuisance which must be overcome in order to assure greater regularity of performance. From the military standpoint fog and clouds are not always a hindrance, and at times should be regarded as a possible means of extremely increasing the offensive power of aircraft.

The ability to fly indifferently through clouds would change the whole tactics of aerial warfare. Bombing operations, instead of being confined to clear nights as it was during the War, would be concentrated on those days when the clouds hang low over the enemy territory. A bomber lumbering through the clouds would be completely protected from pursuit plane attack and would be vulnerable only to a well-aimed anti-aircraft fire.

In the order of difficulty of their solution, there are really three problems to be solved, namely, landing, navigating, and finally the control of the plane. Theoretical solutions of all three of these problems have been found and actually experimented upon and, ultimately, a satisfactory application will be reached. The most practical results in solving the landing problem have been achieved through the actual disposition of fog and the use of fog planeing rays.

The navigating problem seems to have been solved by those at least by the use of directional windows and the practical application in its simplicity enables the solution of the landing and control problems. The question of control of airplanes flying in fog or clouds has been approached by the use of the fog instruments but there appears to be a growing impression that it would be better to rely on an inherently stable or automatically stabilizing plane rather than the use of such instruments by requiring the pilot to interpret the reading of the instruments and then himself operate the controls.

Even when all these problems are satisfactorily solved it is doubtful whether the ordinary human being will have the courage to fly continuously through fog which baffles all the senses. There perhaps lies the true root of the matter and the cause of the slow progress made in overcoming a problem which, from the scientific and mechanical standpoints is comparatively easy of solution.

## Air Mail Contract Payments

Statement To April 15, 1927, of All Air Mail Contract Payments By P. O. Dept.

THE following table contains most valuable and interesting facts regarding the contract air mail operation in this country. Not only are the facts concerning the revenues and costs of the service summarized in a useful manner but in the last column will be found a statement by the U. S. Post Office Department of the total amount of compensation paid each contractor for carrying the mail from the time of starting operations, on each individual case, up to April 15, 1927. This data shows the total sums paid to air mail contractors to date and not the total payments earned by each individual

case. The reason for this is that for the first five months of the several months since opening the compensation to the contractors was on the basis of a percentage of the postage and, therefore, prodraded the accuracy for postmasters certifying as to the actual weight of mail carried during these five months.

It is gratifying to learn that the air mail carried during March was considerably higher than that during February, reflecting the expected increase with the improvement in the season, an increase which, without doubt, will continue.

Route Number	Route	Rate of Pay	Weight of Mail	Weight of Mail	Weight of Mail
1	San Francisco via Honolulu, Oahu to New York	100.00	100.00	100.00	100.00
2	Chicago, Ill. via Detroit and Springfield, Ill. to New York	100.00	100.00	100.00	100.00
3	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
4	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
5	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
6	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
7	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
8	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
9	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
10	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
11	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
12	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
13	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
14	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
15	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
16	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
17	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
18	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
19	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
20	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
21	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
22	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
23	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
24	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
25	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
26	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
27	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
28	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
29	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
30	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
31	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
32	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
33	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
34	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
35	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
36	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
37	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
38	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
39	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
40	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
41	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
42	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
43	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
44	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
45	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
46	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
47	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
48	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
49	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
50	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
51	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
52	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
53	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
54	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
55	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
56	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
57	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
58	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
59	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
60	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
61	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
62	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
63	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
64	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
65	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
66	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
67	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
68	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
69	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
70	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
71	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
72	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
73	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
74	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
75	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
76	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
77	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
78	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
79	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
80	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
81	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
82	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
83	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
84	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
85	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
86	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
87	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
88	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
89	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
90	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
91	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
92	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
93	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
94	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
95	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
96	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
97	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
98	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
99	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00
100	Chicago, Ill. via Detroit, Ill. to New York	100.00	100.00	100.00	100.00

### Mail Payments for Forest Patrol

The air patrol of the Forest Service, designed to detect forest fires, will receive a bonus of five per cent on the amount of the contract for the year 1927. The arrangement has been made with the Postmaster General, Harry S. New, so as to remove the possibility of the funds being held without actual provision. The Forest Service has no airplanes and therefore has no place provided by the Department of War, but now of the Army machines were available for use this season. The plan will be reviewed by the Post Office air mail staff.

### Williams to Compete in Schneider Race

Left Alfred J. Williams, Jr., will compete in the Schneider Cup Race, which will be held in Venice, Italy, this year. The National Flying Club, which is the sponsor of the race, has announced that Williams will enter. The designing of the machine was done by the National Flying Club. Williams, from which he selected the name, competitive. The plane will be ready for test flights in about a month. Williams will make the tests, possibly at Port Washington, L. I.

## Night Flying Equipment for the Airdrome—Part I.

An Aeronautical Discussion of the Present Status in Development of Airport Lighting.

By WILBUR T. HARDING\*

IT IS AN acknowledged fact that the success of commercial aviation is dependent upon the establishment of numerous airports and upon the maintenance of a schedule of the airplanes over the established routes. For aviation to compete with other methods of transportation, it is necessary to carry out both day and night schedules. In connection with the latter, the Department of Commerce is at present engaged upon the making of an act, and is establishing various airdrome lighting fields. Previous to this latter activity, and more especially since, various airdromes, or private airports, have installed plans for the establishment of a permanent airdrome and have in many instances made special program towards installing night flying equipment. At these airdromes, this article is offered as an abstract summary of the subject with the hope that the airdrome installation herein may be of aid to the public at large as a summary of the experimental work at McCook Field to date.

**Resolving Beams.** At night the majority of lead work, which usually lead from the to the airdrome at the central tower during daytime operations, are not used and a pilot must depend upon some other means of resolving his direction. In general, such lights along main highways, lights of other, and lights at water level to help keep the general direction. During some hours of the night the aid of these landmarks and some other means is necessary. These signs, the installation of airdrome lighting to assist in the general direction is a necessary part. For this reason an artificial landmark is usually established at the airdrome. For short range it may suffice to illuminate briefly a large water tower pointed light. The airdrome itself, in an airdrome, is pointed and illuminated, a light beam, as well as the aid of the airdrome. It is a more established rule to install a high intensity searchlight arranged to revolve in the airdrome of a lead beam.

The general arrangement is shown by Fig. 1. The searchlight beam consists of a 21 in. diameter, pendulum, carried with an unobstructed long course of the tower. The pendulum beam has a small angular spread, approximately four degrees, with an intensity dependent upon the beam spread. The beam is carried by a motor enclosed in the beam, which the beam a track and slip rack assembly for the airdrome car. The motor has at least double the airdrome car degrees per revolution (not a time degree control). There is a pendulum idea that the beam should be elevated approximately 45 deg. Obstruction of such a beam would only be made under weather conditions or air conditions in which the airdrome were filled with material objects which would be illuminated or which would reflect the light. A fixed view of the tower is desired. The airdrome is mounted on a track as shown in the beam, yet keep the beam low as possible. At a distance of 20 miles from the tower in land country, due to the actual curvature of the earth and to atmospheric refraction, the bottom of the beam is elevated 300 ft., the airdrome is elevated 3000 ft., and the top is elevated 3200 ft., approximately. It is the beam here

elevated 3200 ft., a pilot of 10 miles and 3000 ft. elevation would be below the beam. Fig. 2 gives a chart showing elevation of the beam for various distances and beam spread.

The beam should revolve not over 2 rpm., as the time of flight would be too much. The Department of Commerce specifies a rpm. which gives a satisfactory flash but impairs the internal beam focus.

For continuity of service the beam may be equipped with a lamp changer. This device, shown by Fig. 3, again built-out at the running lamp, automatically allows a spare lamp to come into focus and makes the necessary electrical connection. This type has an auxiliary signal system which will light a signal lamp or ring a bell when the operation has taken place, so that the running lamp will be replaced without delay. Fig. 1 shows the lamp changer installed in the beam. In order to accomplish changing during daytime operation, and without burning the lamp, a lamp roller can be applied. This roller is also shown in Fig. 3. The roller lamp roller may be moved from the beam and the lamp placed in focus by the roller. Upon replacement of the lamp and roller in the beam the lamp will be in focus.

The lamp mounted above and shown by Fig. 1 and 2 is a



Fig. 1—A searchlight airdrome beam.

\*General Manager, McCook Field, Dayton, Ohio. In charge of the development of Radio Flying Equipment for the U. S. Army Air Corps. Field, airdrome, in New York, which is a private airdrome, in the beam, as well as the aid of the airdrome. It is a more established rule to install a high intensity searchlight arranged to revolve in the airdrome of a lead beam.



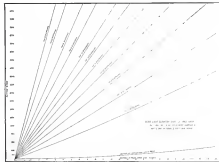


Fig. 3—Lamp beam showing chart.

1000 watt, 22 volt, G-55, 4 amp, monophase filament lamp with a spread two power beam. This lamp was developed for beacon service and has proved quite satisfactory. It is quite rugged and has a long life, the average of which is over 500 hrs. The low voltage filament operates at the high value of luminous efficiency of 38.3 lumens per watt. The total of lumens is 63 per cent more than that produced by the 110 volt, 1000 watt, T-26 projection lamp. Such a lamp, as the light source, increases the range of the beacon and

lengthens the time of flash, due to the regular spread of the beam.

**Boundary Lights.** Upon approaching an airfield at night, the pilot is attracted to the lights of the landing area. The usual method is to place touch-down lamps in an upright position at various points of the boundary to give an outline form, the shape and location of the wireless boundary. In addition, these lights should be placed so that a pilot viewing the boundary lights at a normal glide will also see all obstacles either within or without the boundary. Thus, a pilot who gives ample clearance to the lights should feel assured that he is safe in setting his wheels down without that aid.

To mark the boundary of an airfield a permanent underground system is best. The individual boundary lights should be placed at a height dependent upon the surroundings so as to extend approximately 200 ft. apart. The boundary light

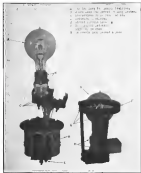


Fig. 4—Lamp showing 1000 watt and lamp holder



Fig. 4—Range lights.



Fig. 4—Boundary and obstacle light fixture

be of clear glass, and is provided as a protection from weather rather than as a lens arrangement to produce more light in one direction than another, as the task is to be equally visible from any point in the air. Fig. 5 shows a satisfactory bronze, vaporproof fixture which is superior to the usual breaked fixture.

For a standard for the fixture, two to three inch outside, tapered with a key and spline for the fixture and set in a concrete base, is satisfactory. The electrical circuit may be completed to the underground boundary light circuit by means of two conductors, and control cable. Once installed, such a unit is permanent and fool-proof. The lamps usually recommended are 25 watt, 110 volt. In more hazardous situations, however, as a ground rule the 25 watt lamp should 200 ft. apart, is simple. All boundary lights should be connected to one or more circuits subordinated at a control post and should operate continuously throughout the night.

**Obstacle Lights.** Once the boundaries of an airfield are noted, the next of importance are the obstacles which must be avoided. These must be marked in a manner that will tell the location, top and nature of the obstacle. In determining the distance from the obstacle, and height, will show if the obstacle is viewed with plenty of margin by a 5 to 1 gliding angle. Many obstacles can be left unmarked, by proper height of the boundary lights.

The usual method is to employ an incandescent lamp in a boundary light fixture with a relay glass of high light transmittance qualities. A 50 watt 110 volt lamp is usually recommended. The installation of light marking telephoto lens, transmissives lens, from, bronze and brass adjacent to the field are standard. The fixture is placed upon the end of a length of insulator, strapped to the obstacle with the light above the obstacle, and connected, if possible, to the underground system with HXL cable and primary cable (insulator). For a first relay, to allow time in relaying the best method is to run in underground cable in Fig. 6, at night, by means of the line (insulator). Heavy duty, portable cord is used from surface to ground and the cord may be stored in a "roll" box at the first during the day.

For stacks the same arrangement is applicable, although it is advisable to place the tapered poles on an area 5 to 6 ft. away from the stack. Such a unit is inverted and the chimney and relaying. For water towers, four lights should be equally spaced the top, and two lights on the top, are satisfactory. For water towers each should have a total of three lights, with one light at the top, one at the third level, and one at the second level. With the above three should be no center for a relay between the towers. The bronze should be marked with two obstacle lights placed above the drain, on opposite sides of the platform, to take care of this obstruction as over the horizon is not operating.

All obstacle lights should be connected to the boundary light circuit of ground, and should operate all night. When obstacles are remote from the boundary light circuit, and where it would be practical to extend the same to the obstacle, separate conductors will have to be made to have the obstacle lighted and fed from another source. This can be accomplished by a separate meter for the installation of an private property, or by a rental agreement with the party who pays the lighting bill.

**Wind Direction Indicator.** Once the natural altitude and the boundary have been noted the best approach may be determined provided the direction and relative velocity of the wind are known. For daytime use the wind rose, or, given an immediate indication of the direction of the wind. Also, if time may be taken to observe the same adequately, a relative indication of the velocity may be obtained. For night use, although to characterize the color, either indirectly or indirectly, have not been satisfactory and consider indicator has been adapted, both for day and night indication. The wind rose, Fig. 7, representing a sensitive airplane, is provided upon a vertical axis and by means of a large, vertical tail surface, is loaded into the wind.

The outline of the rose is made visible from the air during daytime operation, by means of the painted surfaces, draped extremely orange and black. This combination of colors produces the best visibility for various atmospheric conditions and backscatters. At night the outline is indicated by means of two rows of 16 watt incandescent, in series, placed on the upper edges of the rose. The electric current for the lamps is taken through a slip ring and brush arrangement in the control support.

**Angle Reflectors.** The control surveys of the air operation office, should have been previously illuminated by means of a number of angle or semi-circular reflectors. Approximately eight, with 35 watt lamps, is advised. This arrangement will indicate a point in the air, the relative height and, as the ground, where to land.

**Marginal Floodlights.** It is desirable to have a number of floodlights available. A satisfactory unit is a 34 or 16 in. marginal floodlight, with a plain lens and a 300-500 watt, 110 volt lamp. Fig. 8 gives an example of such a unit. If the airfield is partially bounded by a row of houses, it is convenient to have one on each. For ground light during two or more should be arranged to illuminate the roofs and sides of several houses, adjacent to the field. These should operate continuously, in a manner similar to the beacon light, in an attempt to illuminate the landing field. The remaining lights are to be used for illuminating the ground adjacent to the houses while working upon an airplane.



Fig. 7—Day and night wind direction indicator





importance. Corrections can be applied for altitude. For landing or maneuvering, the device will always reflect the point at the stalling speed of the plane it approaches, in other words, the stalling speed will be always shown at the same point in the scale regardless of altitude. This quality is of great importance in such cases.

Johnson showed also a tachometer which, besides indicating the engine speed, registers its accurate time of operation—quite a useful device for keeping track of the time between engine overhauls.

A fine capacitor for field operation of simple and practical design was also exhibited. The appearance of this device on the market is significant, as it is promising of a good volume of business in operation of flying fields.

Designers will have found of interest the adjustable nut developed by McCook Field and exhibited by Johnson; just two taking pieces, a rubber cord, a locking handle, and the nut itself. To suppose that one wouldn't find this type would not be a moment as a barber's shear is the false airplane hushers shop.

A tendency to use wheels which might be called of the streamer disk type was noticeable. In this type, the disks themselves take the landing loads and being flexible than the spoke type, these wheels may press lighter together with shocks and metal fittings.

#### Brakes

Brakes also have shown a desired predominance. The two types exhibited, Bendix and Remondé, have been successfully tested in Government and commercial airplanes. The advantages of brakes in airplanes are well known. Army experiments at McCook Field have shown that a plane can land with locked wheels in the average emergency without turning over if the wheels are properly located. An angle of six to ten feet, 30 feet between the CG and axle line, in side view, and the ground, when the tail is down, is considered sufficient. Most of the small airplanes satisfy this requirement without need of alterations.

A feature, advocates of which cannot be over emphasized, was the use of the Consolidated Curtiss airplane. Col. V. E. Clark introduced this design as his business plane design many years ago with success. Located in the dash board in front of each cockpit, they allow sufficient space for the instrument without reducing the protective effects. For training and the fog flying, the possible injury of the pilot is much minimized.

The greasing use of metal propellers was another tendency shown by the Curtiss Propeller. The Curtiss metal propeller flapped from a single standard knob when a compound and

dependable unit. No hub is required for this type, the splines of the engine shaft meshing directly with those cut in the propeller itself.

#### Adjustable Pitch Propellers

Standard fixed propellers have great adaptability because of their adjustable blades. The frequency to the speed indicated by a design was not observed, with the result that the propeller must be altered. In this type the blades can be adjusted for best efficiency under any speed condition in the neighborhood of the use for which the propeller has been designed. Different combinations of blades and hubs can cover many types of engine and of airplane with only a minimum number of different parts.

Fixed propellers are considered in spite of their higher initial cost because of their higher efficiency and dependability. The three-bladed propeller exhibited has the advantage of reducing vibration. Two-bladed propellers have a tendency to vibrate during climb maneuvers although their efficiency is higher than that of three-bladed ones. Both types have fairly definite fields of application.

During the entire display the Hapwood engine starter made an interesting demonstration. There is no doubt about its dependability and it seems it would prove of great use for field service. Passengers taking a ride seem quite worried when the engine makes a difficult start.

That the streamer type of engine has dominated almost entirely the commercial field of aviation was plainly apparent at the Display. Air-cooled power plants have not yet been developed capable of delivering as much power as water-cooled ones in a single unit. This is probably due to the fact that the design features are usually different. However, V-type air-cooled engines have been developed successfully and it is felt by many that this type may finally supersede the water cooled power plant.

It is very significant also to note that more than 550 hp. has already been obtained from a single radial air-cooled engine the standard practice. That is a real challenge to the water-cooled engine of high power.

In military lines recently, however, water-cooled engines have still many applications.

#### Ball Bearings

The use of ball bearings in aircraft engines appears to be on the increase. In the past, ball bearings were heavier than ordinary ball bearings for a given load, but at this time, the increased performance in the manufacture of ball bearings shows the use of smaller sizes for similar purposes than in



The new Fiat Air Sedan (Whiteland report)

the past. The deep groove types of bearings, most of which were shown on the stand of SKF Industries at the Display deserve great credit in this line.

The Fairbanks-Corse engine was one of the novelties of the show. While it is already known to most aviation readers, it is interesting again to point out its extreme simplicity. The shaft turns at one half the revolutions of the usual type of engine for a given piston speed; this feature makes possible the use of a slow revolving propeller with increased efficiency mounted directly on the main shaft. There is no need of reduction gears to operate the valve gear mechanism in the engine here seen for every four strokes. All this goes to reduce friction and obtain a maximum thrust horsepower out of a given amount of fuel with a simple mechanism.

#### Metal Construction

The progress towards metal construction versus wood appeared to be very noticeable. There has been much comment about corrosion of aluminum alloys which undoubtedly has been responsible for the lag in development. Aluminum alloys under design examinations do not corrode more than steel and, if properly protected, can be maintained free from deterioration for an indefinite period. Ford metal airplanes have been operating for many months without suffering any difficulty along these lines using no protective coatings. It is surprising how the problem is not as much because of the action of sea water but even so, proper inspection and

care will greatly minimize the danger of corrosion.

The Hamilton monoplane exhibited in a good example of the all-metal, internally braced, retractable wing. Built around the Warfield engine, it can carry three passengers besides the pilot. The driver design of the passenger compartment shows a very novel accommodation with a naturally narrow fuselage. This is achieved by using the wing roots as part of the cabin, the lower two of these is covered with all-aluminum alloy and affords a very close space downwards. The non-structural members are aluminum alloy channels riveted together.

Glenn L. Martin exhibited a large four-purpose X-ray plane of interesting features. It presented quite a contrast with the other small commercial planes. This machine carried a larger engine than any other airplane exhibited—the Packard type 5000 water-cooled delivering about 250 hp. at normal speed. The fuselage is of the welded steel tubing type with the metal bracing.

The last Martin product—an all-rotated amphibian airplane also of the three-purpose type—was not exhibited as it was undergoing tests at the time. In this new plane Martin engineers have made a considerable amount of weight which made possible the selection of a conventional gasoline power plant in carrying the new world load than a vessel in its own airplane. The new structural members developed are the result of long and extensive tests carried out over a long period. It is said that the performance is

(Continued on page 1937)



AT THE AIRCRAFT DISPLAY. On the left, the Curtiss Hawk; on the right, the Alouette Hawk. (Continued on page 1937)



A new Fiat passenger Air Sedan (Whiteland report)

# The Aircraft Display at Bolling Field

*Aircraft Engine and Equipment Manufacturers Add Largely to Display Interest*

LAST WEEK we discussed under this title the exhibits of airplane manufacturers at the recent All-American Aircraft Display held at Bolling Field, Washington, D. C. Owing to the pressure on space it was impossible to publish complete details of the display in one issue of *AVIATION*, and a general description of the exhibits at manufacturers of aircraft engines is given herewith together with details of new engines exhibited.

## Aircraft Engine Manufacturers

### Curtis Aeroplane and Motor Co., Inc.,

Garden City and Buffalo, N. Y.

Representing here strongly were models to the exhibit of the Curtiss Company, as far as aircraft are concerned, at which time the opportunity was taken of commenting upon the pioneer work for which this company has always been responsible. At its booth alongside the exhibit of the P.L.A. and the D-32 motor, the Curtiss organization showed a complete D-32 aircraft engine of the type as well known throughout the aeronautical field. The D-32 engine is a 539 hp. turbo-cylinder Vee type of very small frontal area compared with its size, a factor which, together with its low weight per horsepower has established it as an engine in the speed category achieved by this engine in Curtiss designed planes. Included in this engine exhibit was a very interesting show case display the extensive great mechanism of the D-32 engine.

### Detroit Aircraft Engine Corp.

Detroit, Mich.



The Air-Cat (left) constructed by the Detroit Aircraft Engine Corp.

One of the great attractions of particular interest at the Aircraft Display was the exhibit of the Detroit Aircraft Engine Corporation.

This company showed, like the Air-Cat, a new air-cooled radial engine. This particular engine, designed by Oliver D. Wright, answers a demand which has been increasing rapidly during the past year—the need for an improved engine in the field in which the need is very pronounced.

The engine is a five-cylinder radial type, equipped with twin Scottelli magnetos. The radial engine shown at Wash. again had a cylinder capacity of 234 cu. in., but the production engine, it is understood, will have a capacity of 2500 cu. in. In fact, the engine stood up remarkably well and has proved satisfactory in every way.

### Fairchild Connors Engine Corp.

New York City, N. Y.

On the Fairchild stand there was exhibited, in addition to the Monoplanes and the numerous extremely interesting Connors engine with a part of the "crankcase" removed. One saw the term "Crankcase" for want of a more accurate case, for, in the absence of a crankcase—a characteristic of the Connors engine—it is difficult to see why it should have a crankcase.

This engine is an extremely interesting development and there is little doubt that it has a wide future. Its simplicity recommends it while among its outstanding advantages is its great fuel economy, quality of being so efficient a two in one pump engine but devoid of the added weight and complexity of gears.



The Fairchild Connors engine mounted at the Aero show.

### Packard Motor Car Company,

Detroit, Mich.

With the wide experience and marked success that the Packard Company has had in the design and manufacture of motor cars, it is only to be expected to find this same organization at the head in the development and construction of aircraft engines. An specialist in high-powered aircraft engines the Packard Company supplies the great majority of the large power units in airplanes of the Navy.

At the Aircraft Display the Packard Company exhibited two engines, one, the 1 A-1809, 600 hp. and the other the 1 A-2008, 800 hp. Each of these two engines are very similar in general appearance, but, as it well known, each is also equipped with propeller drive type, while the latter powered unit is also constructed as an inverted engine.

### Pratt & Whitney Aircraft Company,

Hartford, Conn.

It has been mentioned before in these columns that with the extensive reputation of the old Pratt & Whitney company, manufacturers of precision tools, etc., as a background, it was only to be expected that when the Pratt & Whitney Aircraft Company was formed, their first product in the aircraft engine field should be a radial engine. The Waup engine, a 485 hp. nine-cylinder radial air-cooled engine is now used extensively by the Navy and is to be the power plant with

which Boeing and Glenn, for the trans-Continental air mail service will be equipped. Recently, the engine, listed in the Wright Catalog, has made some considerable World records in land speed flying classes.

On the stand of the Pratt & Whitney Aircraft Company, a Waup engine was on view together with one of the new 2400 cc. engines. This engine is also a nine-cylinder air-cooled engine, in design, very similar to the Waup but of larger capacity and development, consequently, higher power, announced as over 550 hp. but not at the time of writing officially stated. This engine, however, presents a case like as much as it is one of the highest power radial air-cooled engines yet produced. It recently passed its official Navy tests satisfactorily.

### Wright Aeronautical Corporation,

Paterson, N. J.

An specialist in the production of air-cooled radial engines, there is without doubt not a company in this country with such wide experience in this field as the Wright Company. Charles E. Lawrence, President of the company, is, in fact, a pioneer in the development of this type of airplane power plant.

The Wright Whirlwind engine really needs no introduction.

for it is without doubt one of the most widely used commercial engines of modern type in the World. At the Aircraft Display, the Wright Company exhibited a 2-5-2 Whirlwind engine, among the eleven power plants which constituted the Biplane monoplane in the air only a few weeks ago for over 100 hr. at the time of the breaking of the World endurance record. There was also to be seen at the Wright booth, a Wright Cyclone engine, which is a heavy duty air-cooled engine of great quality. This latter unit develops 525 hp. as opposed to the 525 hp. of the Whirlwind.

It is interesting to record at this time, that the addition of the "soft" X-2 to the engine designation of the Whirlwind engine indicates that the engine has been produced for commercial use. The only difference between the commercial Whirlwind and those produced for the Government—and it will be recalled, that these engines are standard equipment in their power class in the Navy—is that the commercial engine undergoes Wright company inspection during manufacture while the Government engine is subjected to Government inspection. The actual quality of the engine, however, whether in commercial service or in naval aviation, has been proved to be beyond all reproach from the standpoint of reliability, endurance and economy.

## Equipment Manufacturers

### Acme Wire Company

New Haven, Conn.

This company manufactures the well-known Acme quillens, coils, and on engine engines. The stand which it had at the Display contained samples of its armored and wire-wrapped coils, with shrouding, idlers or break, assembled and reassembled. A double armature was consisting of conductor strands, covered with cotton wrapping over which there was a coat of enamel in light colors (red, white, blue, green, orange, etc.) was also shown. The enamel has a most unusual flexibility and withstands rigid bending tests.

### Aero Supply Manufacturing Company

College Point, L. I., N. Y.

Upon exhibiting specimens of various machine parts for airplanes, the prime is of this company, were an exhibition of its booth, samples of steel tubes, wires and various other parts were also shown.

### Airships, Inc.

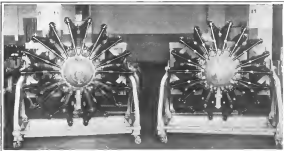
Washington, D. C.

As an illustration of the artistry this manufacturer, this company had as view the Airships of various types. The Airship is an emergency boat made of a reinforced rubber and arranged to be inflated with carbon dioxide gas, obtained from a steel bottle, in which it is secured in liquid form. One of these Airships was displayed with a Johnson outboard engine attached to the stern. The Airship was made in three sizes to carry six, ten or twenty men. The first also carried a small model of a spherical balloon.

### American Oil Company

Bethesda, Md.

Airships also in rubber and a huge map showing the route of the Pan-American (and World Flight) with the numerous most used Acme gasoline and oil were and exclusively by the Lansing engine in the flight was the entrance of this company's display.



The Pratt & Whitney Hornet (left) and Waup engines showing the cylinder shrouding in design. The enormous larger size of the former will be seen.

## B. E. T. Corporation of America

Philadelphia, Pa.

At the stand of the B. E. T. Corporation at Ansett, there was shown one of their large portable landing flood lights of the air and type, with two kinds of illuminating units, one being the air and the other a 10 c.p. incandescent electric unit. One of these landing flood lights was shown in the hangar, and the other was mounted on the field and took part in the night flying demonstrations. The unit shown in the hangar had a movable strap shutter, which has just been developed for the purpose of providing a dark lens over the field to prevent the vision of the pilot from becoming dazzled when taking across the field. This shutter is operated by hand, being controlled from the back of the unit. The company also exhibited four of its 100 day, one thousand watt, landing flood lights, and one of its engine-driven flashing lantern, one thousand watt size. The flashing mechanism of this lantern is a standard Reynolds engine-driven type. Further.

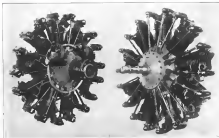


Left: Curtiss Model A-1. Right: Curtiss Model A-1. Both units are shown in the photograph.

## Berry Brothers, Inc.

Detroit, Mich.

Berry Brothers, Inc., whose Berry-Bell, General and other aircraft engines are in use throughout the industry, had various flashing lights on view at their stand, and a General-Detroit freedom with the Berry products. Further at the Detroit News-Michigan Arena exhibition.



On the left, the 24  
Watts, 1000  
Candle (12 ft. by  
12 ft.)

Aircraft Development Corporation all metal landing parts were shown, spray mounted with two different sizes of Berry-Bell's special search. An instrument board, controlled with Berry-Bell's single and revolving lamp flash, was also a part of their display.

## The B. G. Corporation

New York City

A case, showing in section and otherwise, a large collection of spark plugs from all countries of the World, and various carburetors and parts used in the manufacture of the B. G. plugs, represented this company's contribution to the Display. The new engine plug, used in Pratt & Whitney, Wright and other engines, was shown. The type of plug made with the standard matrix thread, or half inch, twenty thread, but the plug is very much reduced in size and weight below that of the ordinary spark plug.

## Herbert E. Bucklin Corporation

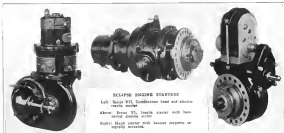
Elkhart, Ind.

Wadell's does work which affords the air type propeller variety of ideas for operation of electric generators, pumps or other mechanisms were on the stand, including the standard propeller case 11 ft. 6 in. With this case, a generator is shown, delivering about 1/2 to 2 kw. at its maximum. One generator and one pump and was shown complete, mounted on electric driven for display purposes. The U. S. Air Mail Service is now using a quantity of Bucklin generator units in Western states for supplying electric to remote locations.

## Detroit Air Appliance Company

Detroit, Mich.

The Haywood high pressure engine starter, and starter work, manufactured by this company, together with the photographs, were shown in the hangar, a complete starter installation being on demonstration, mounted on a Curtiss OX engine at outside of the building. This starter runs over the engine by means of air pressure fed into the cylinder on the power side. The cylinder device is arranged to feed compressed air into the cylinder on the compression stroke after the engine starts turning. The starter is mounted on the end of the crankshaft or the mainshaft, and a rotating distributor disc feeds the air through one hole, while another hole feeds the air into the cylinder under high pressure to the cylinder on the compression stroke. This starter was used on the Wright Whirlwind engine in the Hines-Detroit plane at the Detroit News-Michigan Arena exhibition.



ECLIPSE ENGINE STARTERS

Left: Series VII, Condenser head and electric motor motor.

Below: Series VI, inside starter with two-armed electric motor.

Right: Head starter with longer magnets on supply circuit.

## Eclipse Machine Company

Richmond, N. J.

The Eclipse Machine Company, whose ten years experience in starter design and production has placed it among the leaders in the field, had on exhibition a full line of aviation engine starters and the voltage regulated aircraft generator. This company makes a hand starter and a hand and electric remote type of starters, these new models being additions to the line. The simplest hand starter and hand and electric type, manufactured in the past, are still being made and were part of the exhibition. The new models are made in two sizes, one for engines up to 1000 cc. 12, and the other for engines from 1100 to 2000 cc. 12.

## The Electric Storage Battery Company

Philadelphia, Pa.

The portion of the Display devoted to the various types of airplanes between manufactured by this company, with a collection of photographs of airplanes in which batteries are used. Some of the batteries were cut open to show the construction. In the middle of the bank, the actual battery used by Commander Byrd in his flight over the North Pole was shown.

## General Electric Company

Schenectady, N. Y.

One of the largest, the General Electric Company exhibited a 30 in. incandescent electric motor driven revolving lantern and a 1000 2 kw. 4 cylinder gasoline power plant for aircraft field use or remote location. The company also had on display its special-light electric type of aviation field boundary light. In addition to the display mentioned in the hangar, the company demonstrated at the field one of its aviation lighting equipment, including its new type of landing field flood light, designed to eliminate the entire landing area from a single light unit.

## The B. F. Goodrich Rubber Company

Akron, Ohio.

The case of this company has long been associated with the widely expanding use to which rubber is daily put. With the growth of the aviation industry, this company has endeavored to meet the needs of manufacturers and their position of the Display showed various sizes of airplane tires ranging up to 60 by 14 in. Stock chamber cord, shock absorber and flap, sponge rubber, shock absorber blocks, rubber hand-hold covers for pistons, various hose and similar commodities were also on view. Samples of various types of aircraft tires were shown. This material is made of a hard sponge rubber core, surfaced with either duralumin hard rubber or hard rubberized fabric. The last two types are now in production and are being used for miscellaneous purposes in aircraft manufacture.

## Wagon Wheel Company

Yonkers, N. Y.

This company recently took over the Hot Wind Works, which had been making airplane wheels since 1906. Several surplus wheels were shown, both with and without brake drums.

## Healey Aeromarine Bus Company, Inc.

Rego, N. J.

Demonstrations of one of its motor starters, arranged for operation by hand, and applied to a Fordor 1-1, 2500 cc. engine, represented this company's contribution to the Display. This starter attracted great interest and was in constant use as a means of starting by the visitors.

## Irving Air Chute Co.

Rego, N. Y.

This exhibit at this stand was viewed with much interest by all who attended the Display. From air chutes, built in one for fifteen poles and have been adapted to



A Curtiss-Todd long open parachute propeller



product of that company, and several of its officials, to attend the meeting. Among others attending the conference were Captain Galloway, 27, who built a successful glider plane in 1909, and Earl Douglas, of Santa Barbara, Major C. G. Moulter and Robert W. Miller of the Western Air Express, Arthur Williams, an ex-air pilot for the Post Office Department, Louis Barlow, former air mail pilot now engaged in manufacturing planes in San Francisco, Miss F. K. Koss, chairman of the San Francisco Department Against Domestic Violence, who advised the idea of an airport for the air and Red Nelson, of Oakland, head of a Chamber of Commerce committee which recently induced the authorities of that port to lay 360 acres for an airport site.

The meeting concluded as unanimous in that it was decided by the committee in charge to move an expansion of

the entire scheme of commercial aviation and the various projects they placed in the hands of the best available man for discussion rather than from the other angle, the selection of the northern first. This meeting was considered from the standpoint of an airport for the Western Air Express University, whose airport work is being done under the auspices of the Department of Public Works, from the Army's viewpoint by Lieutenant Colonel Graham, from the Navy's viewpoint by Captain E. B. Smith, president of Western Air Express, the membership's viewpoint by U. V. Thibault, an aircraft engineer now teaching new members of an all-military plane in San Francisco, the business man's viewpoint by Red Nelson, the commercial aspect was discussed by W. T. Boorke, executive secretary of the California Aero Club, and, in part, by Colonel Ely.

## Harris Hanshue Addresses Aeronautical Conference

President of Western Air Express Sets Up New Unit for Measuring Extent of Traffic by Air.

THE GREATEST need, the latest in the end of air plane service, declared Harris Hanshue, president of the Western Air Express, at the second California Aeronautical Conference, San Francisco May 22, is the need for a new way of measuring air traffic, the present time to replace the time formerly used in all traffic and demand that the governing demand on all air transportation be taken in the future.

Mr. Hanshue's law has been discussed by U. Irving Brown, second assistant postmaster general, is to be the present air transportation enterprise of the world because it is the first to make a profit from traffic rather than loss, without the aid of subsidies such as are paid in Europe. Additionally, the first in making more money than any other private mail enterprise because of that, Mr. Hanshue's discussion of the employees of "Air Transportation" from the Department of Commerce attracted unusual attention.

Speed with safety is the principal value of the opportunity offered by the air transport line, Mr. Hanshue said, while the time is the air transport's principal cost factor.

"Other things being equal," he asserted, "the airplane capable of 50 percent greater speed than another will do the same work at approximately 60 percent of the cost of the slower equipment. The airplane, I believe, is the first machine to permit this, namely—the greater the speed the lower the cost per unit, actually, the more valuable the service. In this case fact has the chief factor for aviation throughout all air transport to permit competition with ground carriers—'Flying 100 miles per hour' or 'in commercial aviation,' Mr. Hanshue said that his experience had shown that the average load for express would not exceed 50 percent of their capacity and that this average for the air mail. The additional equipment would be required to run for the peak loads. His estimated 'Revenue 50 percent of the pay had capacity of new airlines because the increased capacity is by regular, scheduled operations. These airlines are in service with development of more efficient equipment either in itself or its power plant. 'It would be ultimately foolish to lay down any fixed plan for the future by discussing the possibilities for even revolutionary conditions in this field.'

### Second Expenses

Looking ahead, Mr. Hanshue said: "The best interests of the nation and of commercial aviation will be served by a more, steady, sound expansion of air transport than mere speculation which offers promise for success rather than by a more rapid, unscientific, hysterical rush into the industry, with the consequent knowledge of protracted failure from mismanagement of scattered profits or subsidies, not only to the detriment of public safety, but of course, equal to safety, solely from these subsidies which have hampered and hindered positively every industry at its inception. There

will be increased here presented and presented with attention both in money and in public confidence. 'But with knowledge of air transport available and widespread public appreciation of the possibilities and its benefits, much of this level can be avoided and this industry can be developed to the increasing profit of the nation's business by popular demand that only economically sound airlines be opened and that none be established and operated in accordance with good business principles.'

### Air Transport Economics

Mr. Hanshue made one of the most striking statements of air transportation's economics that has yet come to light. He laid down, among others, these principles:

At present air transportation has little value save where it serves two or more major communities not linked by a street and cheaper means of communication, telephone. An exception is where a rapid trip, daylight operation can be combined between two communities developing an unusual record of emergency traffic which the airplane can handle in the course of the business day.

The least paying the least performance—that is, the most rapid and foolhardy—increased with greatest passenger equipment used must be used in the periodic operation and must be properly maintained. There must be reserves of planes and of power in each plane.

### Air Mail as Backbone

Air mail must yield the greatest proportion of an air transport plant's income. Express carrying is not feasible except at rates lower than this for air mail. Passenger carrying, by the lowest participation return and service costs, can be applied to the maximum of mail, though in the absence of a mail contract express in sufficient volume may be made to pay. Passenger carrying when combined with a reasonable volume of either mail or express can be profitable of profit.

Only expert pilots and mechanics can be afforded. Personnel should be selected on ability rather than salary basis. In a fully developed system the investment in planes and engines will represent 90 per cent of the total, and flying expenses will exceed 90 per cent of costs.

Mr. Hanshue asserted that the chief danger facing aviation was inefficient, uncoordinated operations with equipment and that of uncoordinated general undertakings in any commercial. But, he said, could be remedied by application of the requirements included in the Air Commerce Act, including the strengthening of government and personnel, and improving the Post Office Department to prevent letting of contracts for routes impossible for either economic or national reasons.

## Side Slips

By ROBERT S. GIBSON

The misadventures of a prominent joint manufacturer are interesting enough pilot who has been in many with his flying and making it such singular interests that he has been moved only by the resumption of operations of joint sides. It is no coincidence that this pilot did not at irregular times—when they are away they are away get away from the field, and when they don't they don't get away from it, and so it is seen that an aviator will always be affected with indignation. If the next emergency would make it worth one while to do so, he would present them from according the unfortunate condition in the industry to the question of air commercial aviation, and possibly they would present him with requiring all pilots to do the same. We can see the difference already. All pilots were not one year old for such their team, or fraction thereof, of commercial flight which they are about to take. This rule must be taken by the pilot in the presence of an incident, who will say his word, but not.

For an additional comparison from the past compare we might as well compare a "Vaseline Club" similar to organizations and purpose to the "Dinner Club" and find his membership restricted to pilots whose club has been served by them.

The Steve Vaseline case in Massachusetts, which is among such common-sense interest and pointed against the suit, the trial was carried on last term resulting some very interesting news lately. One official mentioned that a Mr. C. had been Judge Taylor, who provided during the trial, work in an active manner of the defendant's outside of the court.

The truth of this statement is denied by Mr. C. and he is quoted as having said, "I have known Judge Taylor since 1909. I have never heard him use language that he could not report in a mixed company, and I have played golf with him."

He did not take this to be sufficient evidence that Judge Taylor does not use obscure language. If it is important to find the news whether he does or not, we suggest that he be given a three-minute test as a language-speaking, independent, overhead.

Furthermore, we'd like to inquire what cannot be reported in mixed company nowadays?

Just about the latest news in the history of the Long Beach flying field has been brought out by the present state of their license for the first time for the Trans-Alaska flight through. Some very popular news on various in general and some flights in particular can be overheard in their events of accidents.

A few months ago we took exception in the repeated news items across the three great roads, the amount of air races, altitude flights, etc., stating that we had witnessed evidence of these events and never heard a single other. It cannot be denied that the news enough during the field during these preparations. Whatever use of the planes would get off for a look but there would be great airplanes and there "they're all!" There is their next step and so on. When the plane would arrive the field a few times and find again, the news was not only unusual but greatly enjoyed.

One deep show quite a length when he pointed to the Fokker monoplane and said in a loud voice, "Well, I told you they had added three wings, engines to the Helldiver."

The old Generalissimo's two covered plane drive cycle a crowd for a while, then the report spread around that it was about to take off for the Arctic Circle. The fact that the wings and tail were left to station on the ground and something broken and covered, didn't bother them in this belief at all.



From the Fairchild Aerial Service, Inc.  
The FAIRCHILD SEDAN MONOPLANE  
Powered with Wright "Whisper" 200 h.p. Engine

Equipped with

# SCINTILLA

Aircraft Magnetos

SCINTILLA MAGNETO COMPANY, INC.

Contractors to the U. S. Army and Navy.

SIDNEY, NEW YORK



# AIRPORTS AND AIRWAYS

## Spokane, Washington.

By E. H. H. H. H.

If anyone doubts that Spokane has become a world airport, let him read here events of the last few days in the capital of the Inland Empire.

The landing field portion of the Parkview Flying Field, the municipal airport owned by the City of Spokane, is to be doubled in extent.

Eighteen country club members were placed to work clearing off rocks which are above the surface and when they complete the work planned, 100 acres of level will be available for landing. It will give Spokane one of the finest fields west of the Rockies, with natural drainage.

A Spokane chapter of the National Aeronautics Association has been organized under direction of Valentine Orphie, national secretary, who attended the initial session. Harold L. Dyer, business property owner, was named president; Major Jack Fowler, National Guard Flying Squadron Commander, was president; Walter Jones, section chief, was secretary and Clyde Johnson, banker, treasurer.

Lieutenant W. H. Williams has been placed in charge of photographic work of the National Guard Air Squadron and Captain E. E. Langley will head the aerial detachment.

Plans are complete for construction of a brick \$25,000 runway for the Evans field, work to begin soon. Major Fowler announced that bids will be called for at once.

Major Fowler has been advanced to the place of Commander of the 4th Division Air Service by Major Thompson, Adjutant General. He is head of the 11th Aerial Observation Unit.

Bob Johnson of Spokane, Mont. and Penn. State of Plains, Mont. flew their Spokane into Spokane for more airplanes. Both reported seeing each other, a condition due to a fuel storm in the mountains just before they had hoped off. C. M. Willis, owner of Spokane's plane, came with him as passenger.

Plane Mark B. Moore and Rook were in Pullman, Wash. and crossed passengers on a special "student day" celebration.

## San Francisco Dedicates New Airport

By D. R. Lee

Mills Field, San Francisco's new municipal airport, was dedicated with simple exercises on May 1. The field, which designated an emergency, pending solution of a permanent site, probably will be acquired by the city if no more suitable location is disclosed by an investigation which will be completed early next year.

Meanwhile, slightly over \$100,000 has been expended in putting it in condition and in placing outside for longer space, an administration building and a very elaborate lighting system, probably the best lighting system on any satisfactory field in the west. All this work is complete, the

dedication date having been advanced to coincide with the 10th Aeronautical Conference recently held in San Francisco. Another \$200,000 will be available July 1.

However, the field is suitable for daylight use at present by emergency landing planes and will be suitable for use by all planes by June 15. Its area is 150 acres and the largest run possible on it is over 5,000 ft. The longest run into the prevailing wind is 3,000 ft. Forty planes, the heaviest a Douglas torpedo plane weighing 4,000 lb., back off from it on the day of the dedication.

The soil is loose and dry, with some friable rock interspersed. This is expected to make a very hard, easily dressed field. A logging of the soil and a test surface are to be provided before the field is formally opened.

Everything on the field except the concrete base of the hangar is at such a status that it may be removed to any other site at any time. At the same time, each item is of such construction that it can be removed to any site in a relatively short time. The hangar, 120 by 300 ft., is of steel and galvanized iron and is heated together so that it can be taken down and removed. The administration building, 40 ft. long was purposely designed only 20 ft. wide so it could be pulled up easily and loaded along the highway in any season. The electric lines connecting the boundary lights, flood lights, etc., were laid in shallow trenches so they could be buried and with a trowel and removed in relaying.

The administration building, costing approximately \$10,000, houses a first aid station, meteorology's office, meteorological instrument room, radio room, telephone room, and change room, superintendent's office, waiting room, baggage booth, pilot's room, mail room, and quarters for a caretaker. The field has its own emergency dispatch plant, radio room and electric lights. A public repair shop is planned, but not yet authorized by the city, as are additional hangar units.

Workers of the field extend a great deal of satisfaction and cheer of this site was a consequence, with a variety of conflicting interests among the first schemes of a permanent port should complete of a survey by the Weather Bureau to ascertain which of some proposed sites were most from facts and heavy work. The field is comparatively free from fog but is open to objection on account of its distance from the city, 12 miles.

"Development of the field," said Supervisor Mike F. Kent, chairman of the airport committee of the city government, "is to make this San Francisco a world aviation effort to become the western capital of the West. Aviation will no longer be an orphan child, full of its high days and nights, and beyond the rest of the year, as far as this Francisco is concerned," the supervisor promised, in opening the dedication ceremony.

## Rockford, Ill.

By Whelan, Leavelle

Rockford seems to have been at last awakened to the advantages to be derived from having a permanent airport established in or near the city.

John Caudin, president of the Illinois Chamber of Commerce, and Clarence Patrick, secretary of the local chamber, have returned to Rockford from Washington after having talked with Secretary Duggan on the subject of a military and commercial airport to be built on one of the grounds attached to the Camp Grant military reservation adjacent to Rockford. Mr. Caudin and Mr. Patrick were very enthusiastic over the attitude of War Department officials regarding the project.

Simultaneously with the return of the two Chamber of Commerce representatives came word from Maj. Gen. Mason Patrick that Major Herbert Duggan would bring his leaving. Arrangements in Rockford during his visit with one of the country. As the Rock River flows through the middle of the city, the Duggan Goodwill Day will be able to pilot the "New York" days in the center of the business district. It is expected he will be accompanied by Capt. Ben G. Baker.

# QUALITY

is the first demand  
in choosing material  
for aircraft—

AIRPLANE builders have readily realized the advantages of installing only the finest materials obtainable in their shops. It has been this realization which has made the famous new known as DARTMOUTH-TEX zero cloth, a standard specification of the leading manufacturers in America for over a dozen years.

Dartmouth-TEX is a grade A, mercerized cotton, full count fabric, 36 inches wide, for

## WINGS TAIL SURFACES FUSELAGE COVERINGS

It is guaranteed to meet the most rigid government specifications, and can be obtained on convenient rolls, which insure against cutting and wastage. It is not a processed fabric, although it can be supplied in processed form if required. Suitable tapes of all kinds—surface tapes, tanks, (collapsing)—as any size are required are ready for immediate delivery in all quantities.

Write for samples and quotations.

Sole Distributor

W. HARRIS THURSTON  
THURSTON CETING CORPORATION  
116-118 FRANKLIN STREET  
NEW YORK CITY



## AC Spark Plugs in Plane which established new world's continuous flight record



AC Spark Plugs were used in the Wright "Whitcomb" engine in the Balance Plane, piloted by Ben Acosta and Clarence D. Chamberlain, which recently established a new world's record for continuous flying—51 hours, 11 minutes and 25 seconds.

These the most exacting tests in which spark plugs have ever been subjected and again prove AC superiority

AC Spark Plugs were the choice of these aviation pilots for the very good reason that AC's performance has—undoubtedly for this same reason that they are chosen by the most successful manufacturers.

There is a type and size for every engine—your dealer can supply you.

AC SPARK  
PLUGS  
REGISTERED  
PATENTED

AC Spark Plug Company, FLINT, Michigan  
Sole U.S. Patentees  
Whitcomb—AC 140—AC 140—AC 140—AC 140

AC SPARK  
PLUGS  
REGISTERED  
PATENTED



## More and more, shrewd buyers of aircraft are coming to depend on



Choose YOUR airplane carefully. Choose Travel Air—you won't go wrong!

Literature on request.  
**TRAVEL AIR MFG. CO., INC.**  
Dept. A WICHITA, KANSAS.

### PERRY-AUSTEN

Acetate Clear  
Nitrate DOPES Pigmented

**PERRY-AUSTEN**  
**CLEAR ACETATE DOPE**  
*The Leading Undercoat*

The Best Finish (Undercoat—One Coat Acetate)  
(Undercoat—One Pigmented Dope)

Perry-Austen Mfg. Co., Staten Island, N. Y.  
Contractors to United States Government

### NORTHWEST PILOTS ATTENTION

Nothing but a Model 10 Waco will satisfy you after you see it demonstrated, order now for early delivery. We have FOR SALE, One Model 9 Waco, always kept in hangar, CWS motor and about 150 hours, plus used six months price \$1800.00.

One flock wing these passengers please visit throughout, come to see, \$1100.00.

Two COWAS motor completely overhauled, by competent mechanic, Brand New Super Mags, New Regs, New Valves, First Class Condition. Price \$500.00 take for one or will sell separately.

**Harris Rankin Flying Service**  
Box 4268 Portland, Oregon

was circling over Wright Field, Fairfield, Ohio, at an altitude of about 3300 ft. Through a defective fuse the bomb exploded prematurely about the feet under the plane, between the rear cockpit and the tail. The heavy impact shook the plane throughout and the bomb completely blinded all the personnel on board.

Last-minute tests immediately found that the detector control was seriously affected, and he had to use all the strength in his torso and arms to hold the controls forward and keep the plane in flying position. In this emergency he deployed great neck-shoulder-arms, courage and flying ability. Concluding that the plane was seriously damaged, he actually redetermined to turn off personnel to take to their parachutes. Not being able, however, to obtain immediate communication with those in the hangar, he determined to land the plane if it was in any way possible. After further testing the controls he found that there was a chance to bring the plane and all aboard to earth in safety. He carefully did his maneuvers, the damaged machine that a good landing was made in the darkness on Wright Field, with the aid only of the landing lights which the ship was equipped.

When the suspended aircraft reached earth it was lowered that all of them had been prepared to jump with their parachutes after the first shock of the explosion.



P. A. H. Photo  
© Flying Jetties with dopes he has brought in, demonstrating they were in Air Corps tests and passed in flight.

### Langley Continues Cruise

Amusement has been made that the recent accident on the experimental aircraft "Langley," in which the electrical equipment was paralyzed when the rotor of the 500 kilowatt generator stopped, will not deprive the U. S. fleet of the services of this vessel during the post-war and Navy maneuvers in the Narragansett Bay area from May 16 to 25.

### Airship Breaks from Moorings

The TOS, 202, the Government's largest type of semi-rigid airship, broke from its moorings during a forty-mile gale at Fort Leavenworth, Kan., May 3, and collapsed 300 ft. away, after the rip-cord had been pulled. No one was aboard and the damage to the ship was small.

The airship arrived at Fort Leavenworth on May 7. It was on its way from Great Falls to Fort Belknap, in preparation for the air maneuvers there. It had made the trip to Fort Belknap, but was unable to land because of high winds and had returned to Fort Leavenworth to await better weather.

### Service Units on Making Air Obstructions

Increased safety in flying in the United States is the aim of a standard program for making and lighting obstructions to air navigation just approved by the Department of Commerce, the Army Air Corps and the Bureau of Aeronautics, Navy Department.

According to provisions of the approved report, all air structures, towers, masts, radio masts, communication poles, flag poles, etc., in the vicinity of airports, intermediate landing fields or civil airways, must be painted to insure maximum visibility from the air. The method followed will be to use alternate bands of white and orange yellow, separated by black bands running horizontally about the obstructions.

At night the obstructions will be marked at the top with flashing red lights. These shall be 3 ft. from sunset to sunrise. Additional flash red lights will be used on radio towers, control and two-ends of air routes from the ground.

Civil airways are defined as those three miles wide between airports. Transmission poles, lines, bridge spans, etc., within this area must be marked in accordance with the plan mentioned. At intervals of not over 500 ft., transmission lines will be marked by day with streamers, cones or pencils suspended by wires running parallel to the transmission lines, and by night with flash with lights.

The Committee which submitted the recommendations for the approved report consisted of F. C. Humphrey, chief engineer of the Airways Division, Department of Commerce, Lieut. Logan C. Egan, Bureau of Aeronautics, U. S. Navy, and Lieut. Donald G. Tule, Army Air Corps.

### Army Air Orders

First Lieut. Clarence A. Frank, 1st, detailed to Air Corps, Transport Group, at Fort Belvoir, Ill., to inspect the 2nd Inf., Fort Bliss, Houston, and will report to the commandant of Air Corps Post, Ft. Belknap, Idaho.

Capt. Earl W. Dawson, Air Corps, Fort Riley, Mo., Chicago.

Sen. Lieut. Herbert Vernon Venable, Air Corps, Base, Buffalo, Wyo., to active duty, Selfridge Field, according to inactive status June 30.

Sen. Lieut. Walter Z. Egan, Air Corps, Base, Omaha, Neb., to active duty, Selfridge Field, according to inactive status June 30.

Sen. Lieut. Charles W. Mifflin, Air Corps, Fort San Houston, transferred to Coast Art. Corps, Fort Winfield Scott.

First Lieut. John Ray Fumole, Air Corps, Base, Madison, Wis., to active duty, Camp Perry, Ohio, according to inactive status Sept. 30.

First Lieut. Mark H. Reineke, Air Corps, in addition to active status is designated as model army communication carrier officer.

Capt. Lloyd E. Edwards, Air Corps, Washington, to active duty, March 30.

Sen. Lieut. William M. Green, Jr., Air Corps, Fort San Houston, transferred to Field Art. Corps, Fort Belknap, Tex.

Sen. Lieut. Frank J. Egan, Air Corps, Base, Washington, Ind., to active duty, Selfridge Field, according to inactive status June 30.

Sen. Lieut. Robert Leonard Schenck, Air Corps, Base, St. Louis, Mo., to active duty, Selfridge Field, according to inactive status June 30.

Sen. Lieut. Jacob Ross, Air Corps, transferred to Infantry, Fort Bliss, Houston.

Capt. Henry C. Deppner, Air Corps, Medical Field, to San Francisco, on transport June 9 to the Hawaiian Dept.

Capt. Donald Wilson, Air Corps, Washington, to San Francisco, on transport Aug. 19 for Philippine Islands.

The assignments by First Lieut. Leslie Philip Arnold, Air Corps, of six months as an officer in the Army, transferred.

First Lieut. Albert F. Eckhard, Air Corps, now at Walter Reed Gen. Hosp., Washington, will report to Hqs. Gen. Frank E. Meyer, for consultation.

PRIVATE OPERATORS made the discovery that airplanes engineered to meet the exacting requirements of the POST OFFICE DEPT., were soon converted to keep up and operate thus many so called, "Commercial Ships."

Considering that the initial cost was no higher, it was well worth their time investigating the superiority of RYAN M-1.



Ryan M-1 Main Plane Over San Diego, Cal.

**RYAN AIRLINES — SAN DIEGO.**

**DOPE**  
**THE MOST ECONOMICAL SCHEME**  
**YET PRODUCED**

**TI-TWO**

REGISTERED TRADE MARK

MADE BY

**TITANINE, Inc.**  
**UNION, UNION COUNTY, N. J.**

Constructors to U. S. Government

### Airplanes Motors Supplies Flying Boats

New 120 hp. airplane motor \$1100. new 12000 Buhl or four cylinder \$1200. new 12000 Buhl or four cylinder \$1200. new 12000 Buhl or four cylinder \$1200. new 12000 Buhl or four cylinder \$1200.

2500 and 3500 cubic inch or 1000 and 1500 cc. Standard motor \$1200. Standard motor \$1200. Standard motor \$1200. Standard motor \$1200. Standard motor \$1200.

All parts for 12000 Buhl, Standard, 2500, 3500 and 1000 cc. Standard motor \$1200. Standard motor \$1200. Standard motor \$1200. Standard motor \$1200.

**TI-TWO**  
1st W. Street Ave. Phone 12000 near Cleveland, Ohio



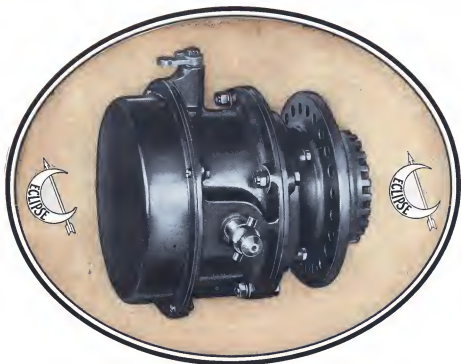












ECLIPSE SERIES 6 HAND INERTIA STARTER  
Particularly Adapted for Radial  
Engines up to 1350 Cubic Inches

# ECLIPSE

## AVIATION ENGINE STARTERS

HAND  
ELECTRIC AND HAND  
HAND INERTIA  
ELECTRIC AND HAND INERTIA

### FOR ALL SIZES OF ENGINES

*A complete line of aviation starters for all  
requirements.*

*Backed by ten years' experience in aviation  
starter design and production.*

## ECLIPSE MACHINE COMPANY

HOBOKEN PLANT

Elmira, New York

HOBOKEN, NEW JERSEY

Walkerville, Ontario